

Nutrition Fact Sheet

An Information Update for WIC staff

■ FOLIC ACID AND WOMEN OF CHILDBEARING AGE

Folic acid is a B vitamin. The terms folic acid, folacin, and folate refer to the same B vitamin. Folate is the form of the vitamin that occurs naturally in foods. Folic acid is important for cell growth and reproduction in the body. Some key functions of folic acid include helping produce DNA and RNA, the cell's master plan for cell reproduction; working with vitamin B₁₂ to form red blood cells; and aiding in the metabolism of amino acids, the building blocks of protein.

FOLIC ACID AND NEURAL TUBE DEFECTS

As a human fetus develops, neural folds fuse to form the neural tube. The brain and spinal column form from the neural tube. Neural tube defects (NTDs) are a class of birth defects that occur when the neural tube fails to close properly. Two of the most common NTDs are:

□ **spina bifida**, in which a piece of the spinal cord protrudes from the spinal column, often causing paralysis below the protrusion.

■ **anencephaly**, a fatal condition in which the brain fails to develop normally.

Experts believe that approximately 50 percent of NTDs can be prevented by adequate folic acid intake by the mother during the childbearing years.

HOW MUCH IS ENOUGH?

The National Academy of Sciences Institute of Medicine (IOM) released new recommendations on folic acid intake in April 1998. To reduce the risk of giving birth to a child with a NTD, the IOM recommends women capable of becoming pregnant consume:

- 400 micrograms (mcg.) of synthetic folic acid daily
- food folate from a varied diet

Synthetic folic acid is found in fortified foods and vitamin supplements. Synthetic folic acid is nearly 100 percent absorbed by the body, whereas food folate is only about 50 percent absorbed. In other words, a woman needs to consume about 800 mcg. of food folate to get the same benefit as consuming 400 mcg. of synthetic folic acid from a supplement or a food fortified with synthetic folic acid.

400 micrograms = 0.4 milligrams

FOLIC ACID SOURCES

Food Folate (Naturally Occurring Food Sources)

The IOM did not make a specific recommendation about the amount of food folate women of childbearing age need to consume daily. However, a varied diet based on the Food Guide Pyramid is important to maintain a consistent intake of food folate. Each of the foods in the following list contains more than 100 mcg. of food folate in one serving and would be considered a good source of folate.

NATURALLY OCCURRLNG FOOD FOLATE SOURCES

FOOD	SERVING SIZE	MICROGRAMS FOLIC ACID
chicken liver	½ cup	538
beef liver	4 ounces	162
peanuts	½ cup	175
sunflower seeds	½ cup	163
spinach, cooked	½ cup	120
spinach, raw	1 cup	108
asparagus	½ cup	121
lentils	1 cup	358
black beans	1 cup	256
black-eyed peas	1 cup	225
refried beans	1 cup	211
pinto beans	1 cup	165
split peas	1 cup	130
kidney beans	1 cup	130
orange juice, frozen concentrate	1 cup	109

Synthetic Folic Acid

In addition to food folate from a varied diet, the IOM recommended an additional 400 mcg. of synthetic folic acid per day for women of child-bearing age. The synthetic folic acid can come from either of the two following sources.

Fortified Grains

On Jan. 1, 1998, the Food and Drug Administration (FDA) began requiring food manufacturers to add synthetic folic acid to most enriched breads, flours, cornmeals, pastas, rice and other grain products. A single serving from any of the fortified products will supply about 40 mcg. of folic acid. To achieve the recommended 400 mcg. of synthetic folic acid from these fortified grains alone, a woman would need to consume up to 10

servings per day. There are a few highly fortified breakfast cereals that contain 400 mcg. of folic acid per serving: Product 19, Total, Total Raisin Bran and Total Corn Flakes. (Note: The folic acid content of these cereals is subject to change at the manufacturer's discretion.) One serving of these highly fortified cereals will supply the entire 400 mcg. of synthetic folic acid needed daily.

Vitamin Supplementation

Vitamin supplementation is another way to assure a sufficient daily intake of folic acid. Most regular multivitamins contain 400 mcg. of folic acid, making supplementation an easy way to meet the IOM recommendation.

COUNSELING RECOMMENDATIONS

Folic acid intake is most effective at reducing the risk of NTDs when it is taken prior to conception and during the first few weeks of pregnancy. The neural tube is formed very early in a pregnancy (18-30 days after conception), often before a woman knows she is pregnant. Because many pregnancies are unplanned, it is important that an adequate intake of folic acid be maintained throughout the childbearing years. For this reason, counseling on this topic needs to be directed at all women of childbearing age.

Nonpregnant Women of Childbearing Age

Nonpregnant women should be counseled to consume diets containing 400 mcg. of synthetic folic acid daily. The synthetic folic acid can come from a vitamin supplement or foods highly fortified with synthetic folic acid such as Total or Product 19. A vitamin supplement is probably the easiest way to assure the 400 mcg. goal is met each day. In addition, women should be counseled on good food sources of folate and encouraged to eat a diet based on the Food Guide Pyramid. Participants should be made aware that one 400 mcg. supplement per day is sufficient to meet the daily goal and that taking more than one pill per day can be dangerous, even if the supplement was skipped on the previous day.

Pregnant Women

Pregnant women should be counseled on the importance of consuming foods high in folate and directed to follow their doctor's advice on vitamin supplementation. Again, it is important to remind women **not** to double the vitamin dosage to make up for a skipped day.

Women with a History of NTDs

Women who have had a child with an NTD have a much higher risk of having another child with the same or similar defect. Therefore, any women with a history of NTDs should be referred to a physician before attempting to conceive again.

References

- Serbanescu, F., Rochat, R., Floyd, V., and Toomey, K., "Knowledge About Folic Acid and Use of Multivitamins Containing Folic Acid Among Reproductive-Aged Women - Georgia, 1995," *Morbidity & Mortality Weekly Report*, September 1996, Volume 45, Number 37, pp. 793-796.
- Wenstrom, Katharine, "Understanding How Neural Tube Defects Occur--And Can Be Prevented Nutrition During Pregnancy," *Medscape Women's Health*, December 1996, Volume 1, Number 12, pp. 1-9.
- Lerner, Henry, "Pregpregnancy counseling for Primary Care Physicians," *Hospital Medicine*, June 1997, Volume 33, Number 6, pp. 28-40.
- Williams, Rebecca, "Folic Acid Fortification," U.S. *Food and Drug Administration - Fact Sheet*, Feb. 29, 1996.
- Williams, Rebecca, "FDA Proposes Folic Acid Fortification," U.S. *Food and Drug Administration - FDA Consumer*, May 1994.
- Foulke, Judith, "Folic Acid to Fortify U.S. Food Products to Prevent Birth Defects," *HHS NE WS - U.S. Department of Health and Human Services*, Feb. 29, 1996.
- Kurtzweil, Paula, "How Folate Can Help Prevent -Birth Defects," *FDA Consumer*, September 1996.
- Johnston, R.B., Staples, D.A., "Use of Folic Acid-Containing Supplements Among Women of Childbearing Age - United States, 1997," *Morbidity and Mortality Weekly Report*, Feb. 27, 1998, Volume 47, Number 7, pp. 13 1-1 34.
- NAS - IOM report April 1998-1 - 8-68